

AMENDMENTS TO THE SPECIFICATION

Please amend the specification as indicated below:

[0004] Conventionally, such a system is known that an ATM switching system is employed to attain a mobile switching station and a voice signal is transmitted between the stations under the AAL2. Recently, a voice CODEC (COnder-DECoder) method referred to as TFO (Tandem Free Operation) applicable to above system is released in accordance with the 3GPP (3rd Generation Partnership Project) recommendation. Thus, the advent of the voice interception system and method corresponding to that voice CODEC method has been ~~excepted~~ expected.

[0011] An object of the present invention is to provide a voice interception system that can carry out a voice interception ~~only~~ by controlling only an ATM switch, rather than ~~without~~ separately controlling both the ATM switch and an STM switch.

[0012] For achieving the above-mentioned object, a voice interception system according to the present invention is a system in which an ATM cell of an AAL2 is transferred between stations. Referring to Fig. 1, this ~~This~~ voice interception system comprises a base station controller 1, a mobile switching station 2, a voice signal processor 3-1 and a third party call apparatus 7.

[0013] The mobile switching station includes ~~an~~ ATM cell assembler/de-assembler units 2-1 and 2-3, a voice monitor (Vocoder) 2-5 ~~having a function of generating an ATM cell of an AAL1 (PCM)~~, and an ATM cell multiplexer/demultiplexer 2-4. The Vocoder 2-5 is shown receiving an ATM cell of an ATM Adaptive Layer One Tandem Free Operation (AAL1 (TFO)), and

converting the AAL1 (TFO) to an ATM cell of a modification of the ATM Adaptive Layer Type 2 (AAL2pf). The Vocoder 2-5 outputs modified ATM Adaptive Layer 2 (AAL2pf) to ATM cell multiplexer/demultiplexer 2-4. And lastly, upon return of the AAL2pf signal from ATM cell multiplexer/demultiplexer 2-4, the Vocoder 2-5 converts AAL2pf to AAL1 (PCM), Pure Code Modulation. The ATM cell multiplexer/demultiplexer 2-4 has having a function of returning back an ATM cell of a modification of the ATM Adaptive Layer Type 2 (will be abbreviated to [""]AAL2pf[""] hereinafter) sent by the voice monitor 2-5 back to the voice monitor in a Tandem Free Operation (will be abbreviated to "TFO") case. The ATM cell of the AAL2pf is equal to the ATM cell of the AAL2, except that the ATM cell of the AAL2pf accommodates one piece of user data therein and does not have a start field.

[0014] Still referring to Fig. 1, the The voice signal processor 3-1 includes a vocoder 9-1 having a function of carrying out a mutual conversion between the ATM cell of the AAL2pf and the ATM cell of the AAL1 (TFO) and a mutual conversion between the ATM cell of the AAL2pf and the ATM cell of the AAL1 (TFO) in the TFO case.

[0015] The third party call apparatus 7 is provided on a side of an STM network in order to finally hear as a tone the content after the conversion into the ATM cell of the AAL1 (PCM) in the voice monitor 2-5.

[0016] Further, an ATM switch in the mobile switching system forms a ~~first path, second path, third path, fourth path and fifth path~~ multitude of paths, designated by encircled numerals 1, 2, 3,

4 and 5, respectively in Fig. 1. The first path ① is set when a telephone call is carried out between stations. The second path ② (Point-to-Multipoint path) is set when each voice signal is drawn into the voice monitor 2-5 in order to intercept the telephone call. The third path ③ (returning path) is set, in the TFO case, when the ATM cell of AAL2pf₁ converted from the ATM cell of the AAL1 (TFO)₁ is sent to the ATM cell multiplexer/demultiplexer, then returned back to the voice monitor. The AAL2pf is converted to ~~convert from ATM cell of the AAL2pf~~ into the ATM cell of the AAL1 (PCM). The fourth path ④ is set between the voice monitor and the third party call apparatus. The fifth path ⑤ is set when the voice is actually intercepted after the third party call apparatus synthesizes the voice signal between the stations.

[0017] The voice intercept system according to the present invention may be constituted such that when a path connection around the voice monitor to carry out the conversion between the ATM cells of the AAL1 (TFO), the AAL2pf₁ and the AAL1 (PCM) is initially set, ~~thereby~~ all the other paths, except the second path, are ~~is~~ fixedly connected in ~~[[a]]~~ an initial setting stage without any intervention of a software control for a call process.

[0018] Also, the voice intercept system according to the present invention may be constituted such that a voice can be intercepted only by setting a half fixed path for the terminal on the side of the STM network, connecting the STM network and the ATM network to each other through a fixed path, and carrying out the call process based on ~~the~~ software only ~~in-a~~ for the path connection process of the ATM switch to thereby control the ATM switch 2-2 as the control of the voice intercept system from the software.

[0019] Also, referring to Fig. 2, the voice intercept system according to the present invention may be constituted such that the voice signal of the ATM cell of the AAL2 is converted into the ATM cell of the AAL2pf in the mobile switching station 2, ~~to~~ sent to the ATM switch 2-2, to the Vocoder, voice monitor 2-5, where ~~and~~ the voice monitor converts the voice signal AAL2pf, captured by setting the second path, into the ATM cell of AAL1 (PCM). The AAL1 (PCM) ~~that~~ can be reproduced as a voice, and then the converted voice signal is reproduced as the voice in the STM network.

[0039] FIG. 4 is a view showing a flow of a decomposition process from an ATM cell of an AAL2 and a conversion into an ATM cell of AAL2pf.

[0044] Still another feature lies in the mechanism that when a mobile switching station is initially set, a path connection (shown by a dashed line/an alternate long and short dashed line except a solid line in Figs. 1 and 2), for the sake of the conversion from the ATM cell of the AAL1 (TFO) to the ATM cell of the AAL2pf and the conversion from the ATM cell of the AAL2pf to the ATM cell of the AAL1 (PCM), around a voice monitor in a mobile switching station is performed. That is, all paths except a point-to-multipoint path (shown by a bold dashed line/an alternate long and short dashed line in Figs. 1 and 2) in an ATM-SW are fixedly connected (Permanent Virtual Channel (PVC) connection) at an initial[[ly]] setting state without any intervention of [[a]] software control for a call process.

[0046] Now, the embodiments of the present invention will be explained below in detail with reference to the attached drawings. ~~At first~~ First, as to telephone call methods, there are a case of a communication between a mobile station and a land station (Mobile-to-Land communication) and a case of a communication between a mobile station and a mobile station (Mobile-to-Mobile communication). In this specification, a voice interception method in the case of the communication between ~~the~~ mobile stations is explained. In the case of communication between ~~the~~ mobile stations, there are two operations, such as the TFO and the non-TFO, used as the method of CODEC (coding process) of voice signal. The respective operations will be described, hereinafter. Also, there are three ~~kinds~~ forms of the interception ~~methods~~. Now, let us suppose that A and B are calling to each other by using the communication between the mobile stations. The three ~~kinds~~ forms of ~~the methods includes~~ interception include a first ~~method in which~~ form wherein a voice of only A is intercepted, a second ~~method in which~~ form, wherein a voice of only B is intercepted, and a third ~~method in which a telephone call between A and B is intercepted~~ form, wherein both voices of A and B are intercepted ~~[[]]~~. The voice interception methods of the present invention to be described later attain ~~[[s]]~~ those three ~~kinds~~ forms of the interception ~~methods~~.

[0056] The operations of the interception system in the non-TFO case ~~(the following operations (11) to (17))~~ will be described below in operations (1) to (7) with reference to FIG. 2.

[0065] The operations of the interception system in the TFO case ~~(the following operations (11) to (18))~~ will be described below in operation (11) to (18) with reference to FIG. 1.

[0067] (12) The ATM cell of the AAL2pf converted at the AAL2 cell assembler/de-assembler unit 2-1 is once passed through the vocoder 9-1 in the voice signal processor 3-1. Also, the ATM cell of the AAL2pf converted at the AAL2 cell assembler/de-assembler unit 2-3 is once passed through the vocoder 9-2 in the voice signal processor 3-2. However, here is a point largely different from that of the non-TFO case. ~~The difference lies in the manner that it is not converted into the normal AAL1 (PCM) because of the TFO case, and it~~ AAL2pf is converted into the form of the AAL1 (TFO). Moreover, even if the ATM cell is sent to the STM network while kept in the form of the AAL1 (TFO), it can not be reproduced as the voice.

[0076] Also, according to the present invention, at the initially setting stage of the exchange, the STM network is connected through the fixed path to the ATM network. Thus, with regard to this voice interception method, as the control from the software, it is possible to carry out the voice interception only by controlling the ATM-SW without any individual control of both the ATM-SW and the STM-SW.